**Personnel Decontamination at a Radiation Incident**

DECON for radiation incidents is done (mostly) without the use of water or other liquid agents. RAD DECON can be performed with limited DECON Line Personnel. If resources are sufficient, assign four responders to the DECON Team/Group. DECON Team will assist exiting workers with PPE removal, conduct contamination surveys of exiting workers, exiting equipment and samples, and the DECON line area. They will also assist with gross DECON of personnel if necessary.

Due to the difficulty in handling and disposing of DECON solutions contaminated with radioactive materials, responder DECON for radioactive material incidents is normally conducted using dry methods. Limited amounts of a soap and water solution may be used for a boot wash or glove wash, with the understanding that the radioactive material is simply being transferred from the person/object being decontaminated to the solution, which then becomes radioactive.

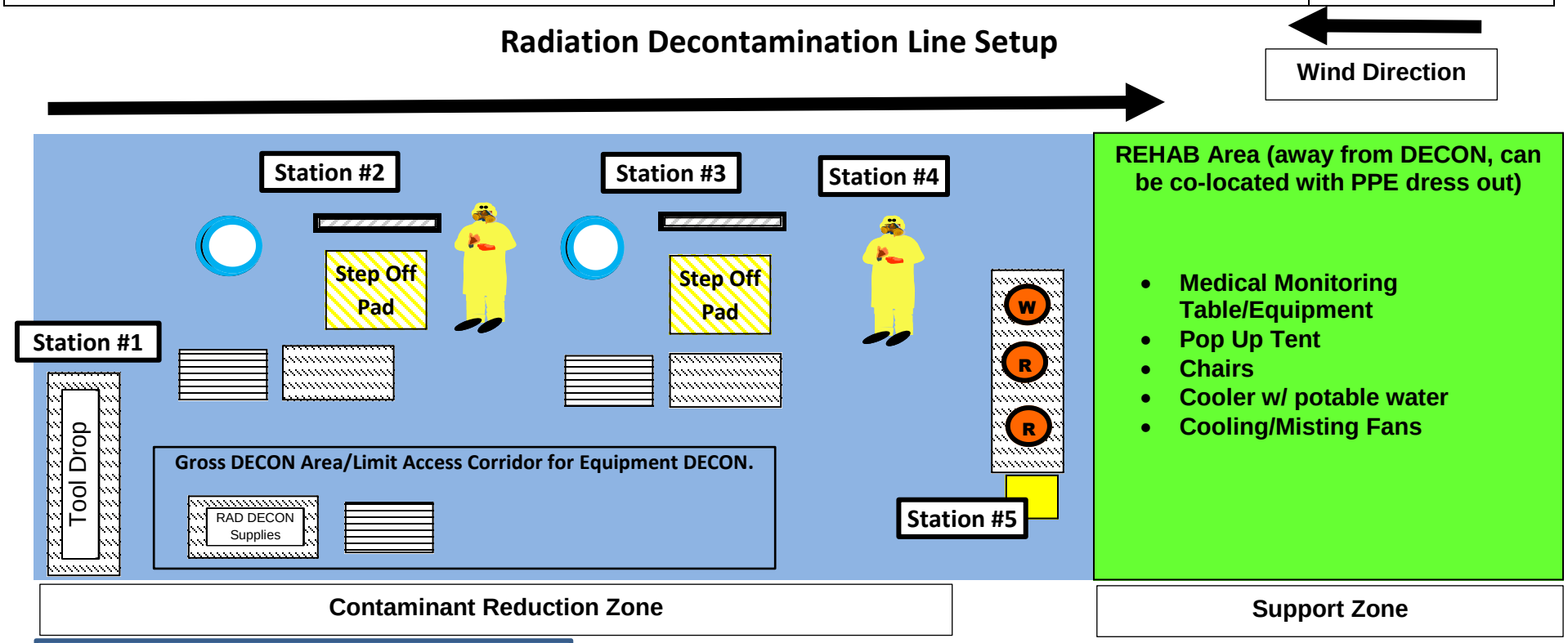
Establish the DECON line uphill and upwind to the hot zone (or at higher pressure, if indoors). Minimize movement of the contaminant through the DECON line. Conduct periodic surveys of the DECON line area to verify that contamination is not migrating from the exclusion zone thru the DECON line, and elevated dose rates are not present due to RAD trash accumulation or storage of equipment/materials.

A Health Physicist (HP), Radiation Safety Officer (RSO) or Radiation Subject Mater Expert (RAD SME) should be available to the DECON Team Leader for consultation. The Radiation Expert will assist with setting the DECON clearance criteria and evaluation of personnel and equipment that may need gross decontamination.

For all true emergencies, life-saving aid comes first. Injured personnel can exit through the limited access corridor; RAD survey and DECON work should be conducted in the exclusion zone (hot zone), IF THE SITUATION ALLOWS, in order to minimize contamination spread without hindering EMT efforts to aid the injured worker.

See SOG D-101 for addition information on DECON Line strategy and tactics.

## Radiation Decontamination Line Setup




**Equipment List:**

1 – 10 x 20 Tarp
2 – Step Off Pads (SOP)
2-4 – Radiation Survey Meters
2 – Drums/containers w/ drum liners for PPE
4-5– Tables
3 – Benches
2 – Saw Horses
3 – 5-gallon Buckets – Mask Cleaning Station
1 – Hand/Face Wash Station
RAD DECON Supplies (tape, RAD-CON, Wet Wipes)
Cones and caution tape to identify CRZ

**Legend**

- Tarp/Plastic
- Step Off Pad
- Table
- Bench
- Drum Liner
- Saw Horse
- 55-gal drum
- W SCBA Mask Wash
- R SCBA Mask Rinse
- Hand/Face Wash Station
- Attendant w/ Survey Meter

| Radiation DECON Line Stations | | |
|---|---|---|
| **Station #1** | **Tool Drop**<br><br>Sample and Equipment Drop: All equipment should be placed in a designated drop area for DECON. Position any equipment and/or instruments that are returning to the EZ so that subsequent Entry Teams can easily collect them.<br><br>Conduct Fixed and Loose Contamination Surveys on equipment and items with survey meter and wipe tests:<br><br>< 2x background = OK for reuse<br><br>Can release samples if container wipe results < 2x background<br><br>> 2x background try to decontaminate or bag & tag, hold for RAD Expert Support | |
| **Station #2** | **Tape, Outer Glove and Boot/Booties Removal**<br><br>Exiting worker will remove (in this order):<br>1. Outer dosimeter, helmet and radio and place on the table<br>2. All tape<br>3. Work rubber boots or boot covers,<br>4. Outer gloves<br><br>Tape, shoe covers, and outer gloves are placed in drum for RAD waste determination. Boots are store for later survey<br><br>Worker proceeds to 1st Step-Off Pad (SOP) area and gets checked for contamination by 1st DECON line worker.<br><br>DECON Attendant conducts visual inspection of approaching workers. Attendant looks for damaged PPE. If grossly contaminated, direct to Gross DECON area.<br><br>DECON Attendant frisks (alpha/beta/gamma) with a survey meter before 1st step-off pad. Extra attention should be paid to hands, feet, and face.<br><br>Exiting worker proceeds to Station #3 (if <2x bkg)<br><br>Exiting worker should not proceed if gross contamination is detected. DECON line worker will direct exiting worker to the Gross DECON Area. Request RAD Expert support. | |

| | | |
|---|---|---|
| **Station #3** | **Outer Suit, Respirator, Inner Glove Removal**<br><br>Exiting worker removes:<br>1. Coverall<br>2. respirator face piece<br>3. Inner gloves<br><br>Respirator face piece is placed in a bin for later survey and cleaning<br><br>Coverall and gloves - placed in drum for RAD waste determination<br><br>As each foot is removed from the coveralls, it should be placed onto the 2nd step-off pad | |
| **Station #4** | **Final RAD Screening**<br><br>Exiting worker must undergo whole body frisk or exit through portal monitor if available and appropriate for the radionuclide(s) encountered.<br><br>2nd contamination check is completed by the Attendant.<br><br>If result >2x background, send to Gross DECON area. Request RAD Expert support.<br><br>If result <2x background exit DECON line | |
| **Station #5** | **Hand and Face Wash**<br><br>Hand and Face Wash. Proceed to the hand and face wash station and wash your hands and face with soap and warm water. Although a thorough wash with soap and water is preferred, utilize cleaning wipes if a wash station is not available. If the Entrant's respirator face piece has been screen, it can be directly handed to the owner for cleaning at the ask cleaning station. | |
| **REHAB** | Proceed to medical monitoring as appropriate. Hydrate and rest. | |

| **Gross DECON**<br>**If gross radiation contamination (> 2 x background) is detected during the survey by the DECON Attendant, complete the following gross DECON Steps:** | | |
|---|---|---|
| **PPE DECON** | PPE DECON is appropriate when the worker can't doff PPE without becoming contaminated<br>1. Wipe contaminated area with moist cloth / oil cloth to remove contamination<br>2. Tape press to remove contamination<br>3. Return to appropriate station if DECON is successful<br>4. Request assistance if DECON is unsuccessful or you're unsure how to proceed. | |
| **Skin Contamination** | DECON methods to use if personnel is not in PPE:<br>DECON is performed in progressive steps:<br>1. Tape press to remove<br>2. Wipe with moist cloth<br>3. Flush with water<br>4. Wash off affected area with mild soap and tepid water<br>5. More aggressive methods require HP support. | |

## G–M DETECTORS JOB AID:

- **Check batteries**
- **Take background reading in an uncontaminated area**
- **Scan slowly and close to the object**
- **Record your survey readings**

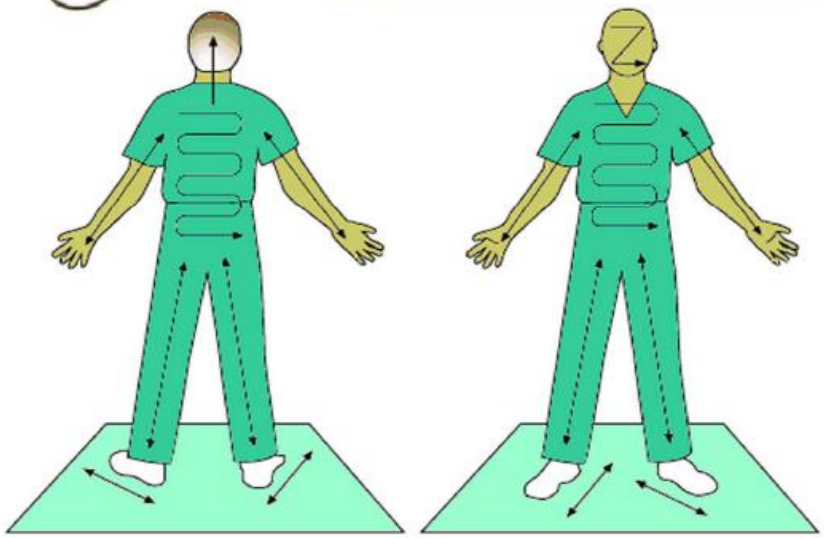


*Figure: Conducting the Survey*

*SAFETY NOTE:*
Do not disconnect or connect the connectors for the coaxial cable on the survey meter when the meter is turned on. You could receive an electrical shock.

## G–M DETECTORS JOB AID:

### Inspect the equipment.

a. Attach the meter to the probe with the cable.
b. Inspect the cable that connects the G-M detector to the survey meter. With the meter on, wiggle the cable near the connectors to see if this causes erratic behavior of sound or display; if so, the cable is defective.
c. Inspect the meter for obvious signs of damage (e.g., broken detector window; broken glass on meter face).

### Perform a battery check.

a. Check the batteries, using the "range" switch or "bat" button; the method depends on the type of instrument. The meter needle should move to an area on scale marked "Bat" indicating the batteries are good. Replace if necessary.

### Conduct a source/ operational check.

a. Place detector close to a check source (e.g., Thorium containing gas lantern mantle in a plastic bag; plastic button "check source" ).
b. Select appropriate range (e.g., x10).
c. Verify meter response.
d. If no source is available, assume the meter is working if the response to background is about 30 to 200 counts per minute (cpm).

### Conduct a background reading.

a. Expect a reading of 30 to 200 counts per minute.

### Conduct the survey (see figure).

a. Move the probe slowly (1 inch per second).
b. Do not let the probe touch anything.
c. Pay particular attention to face, feet, and hands.
d. Locate the points that produce the most clicks and document the reading. Generally, areas more than twice the pre-determined back ground are considered contaminated.

If large numbers of people require screening, to avoid delays, it may be necessary to perform only a "quick look" spot survey of the head, face, shoulders and hands, the most likely locations for contamination.